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BY JOHN GIBSON, B.A., F.G.S., F.B.S.E., AND JOHN MACOUN, M.A.,
Professors in Albert College and University, Belleville.

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THE BOTANY OF THE EASTERN COAST OF
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During the months July and August of the past summer, the writers, in company with James Burns, Esq., of Bayfield, made a somewhat satisfactory, though necessarily incomplete exploration of the Botany and Geology of that portion of the eastern coast of Lake Huron lying between the parallels $43^{\circ} 10'$ and $44^{\circ} 50'$ N. lat. The eastern and western extension of this area embraces only that portion of Western Ontario which is bounded on the west by *Lake Huron*, and on the east by an imaginary line drawn from the southern bend of the *Rivière aux Sables* (south), in a direction N. by N. E., to the mouth of the *Sydenham River* at *Owen Sound* on the *Georgian Bay*. The superficial area, therefore, is by no means extensive, but owing to its northern and southern bearing, and its favoured conditions of climate, cannot fail in a botanical point of view to be productive of many interesting facts in the geographical botany of Canada. In treating of the botany of a district so limited in extent as the one under review, it must be borne in mind that, making due allowance for the varying altitude of the country, we cannot with any degree of precision come to any generalizations regarding the effect of so limited an increase of latitude upon the vegetation of that particular meridian. We can point, however, to the existence, within this area, of forms whose presence can only be accounted for through a peculiarity of causes, geological and climatic; and on this account it is deemed expedient to preface our botanical notes with a sketch of the more salient points in the physical geology and climatology of the district.

From *Cape Ippewash* on the south to the *Georgian Bay* on the north, the general character of the region is level or gently undulating, presenting no conspicuous highlands with the exception of the bold precipitous escarpments found skirting the southern and south-western coasts of the *Georgian Bay*. Along the coast of *Lake Huron*

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from Port Frank to Clark Point the coast is bold but not precipitous, has an average height of 100 feet above the Lake, and is composed of the brown calcareous clays of the Saugeen division, sometimes visibly underlaid by members of the Corniferous and Tentaculite Formations. Westward from the Lake the country keeps perceptibly rising, and culminates in a ridge, running between the Townships of Tucker-smith and Hibbert in County Huron, which rises to the summit-level of 1,050 feet above the sea. The average altitude above Lake Huron is about 222 feet, and above the sea approximately, 900. The superficial deposits of the drift period form the surface of this triangular area, and so vast and universal are these accumulations that access to the foundation rocks can only be made along some of the river channels, and at intervals along the margin of the Lake. These deposits have as yet been but imperfectly studied, but the principal facts of their history, so far as is necessary in the present connection, will be given as briefly as possible. They may be sub-divided in ascending order, into:

1. Erie blue clay.
2. Saugeen brown clay.
3. Local deposits of reddish clay, gravel and sand.

The lowest of these stratified sediments is the *Erie clay*. It is more or less calcareous, containing in many instances 30 per cent. of calcium carbonate, and holds numerous pebbles and boulders alike of Palæozoic, Huronian and Laurentian origin. The second division, or that of the *Saugeen clay* is, along with beds of modified drift, the superficial deposit of the district, and thus demands some consideration in a botanical point of view. It is an aggregate of very fine layers of brown calcareous clay, containing but few embedded boulders or pebbles. Its average thickness seems to be about 100 feet, although in a few instances in north Huron, and along the banks of the Saugeen River, between Hanover and Walkerton, it is found as a very thin bed, overlying a deposit of fine brown sand, into which at different points the clay is pressed in the form of mammillary masses of various sizes. A great portion, however, of this upper deposit of clay is overlaid by beds of coarse gravel and sand, observed capping the ridges of hills which run in a general east and west direction to the vicinity of the Lake. Crossing these ranges of hills almost at right angles, and extending along the western limit of the district, lies a remarkable ridge composed of water-worn gravel and fine sand, whose

general contour is parallel to the present margin of the Lake. Conforming to the irregularities of the coast for about sixty miles, and at an average distance from it of a mile and a half, it reaches on the south the sandy flats of the Rivière aux Sables (south), and is finally lost. The western slope of this lacustrine terrace inclines gradually towards the present Lake beach, and within this limited area deposits of shell-marl are frequently found. Future researches will, no doubt, prove the existence of other terraces lying more to the eastward, which will, doubtless, throw much light on the former physical features of this Lake-area. Hydrographically, the region under consideration may be divided into two, more or less, distinct areas, the one comprising the valleys of the Rivière aux Sables (north and south), the Bayfield, Maitland, and Saugeen Rivers which flow into Lake Huron; the other comprising the bight of Owen Sound, fed by the Rivers Potawatamie, Sydenham, and Indian, and the Bays Colpoy and Hope. These streams, as a rule, are small, and undergo rapid oscillations of level, increasing in the spring to torrents of considerable volume, and conspicuously diminishing towards the fall, when, in many cases, numerous small deltas are formed in the lowlands, composed for the most part of thin alluvial accumulations.

The hydrographic areas thus indicated are naturally separated by the somewhat tortuous escarpment of the Niagara limestone, which, entering this district from the south, sweeps around towards the heights above Cape Commodore, and thence trending northward past Cape Paulet, finally terminates at Cabot's Head, the extreme northern point of the Bruce Peninsula. Throughout its course it conforms with more or less irregularity to the shape of the coast line, but presenting a less salient curve, and in every case exposing its precipitous face to the north and north-east, in cliffs ranging from 50 to 300 feet above the level of Lake Huron. The Clinton limestones, however, are found to visibly underlie the Niagara in the more southern bluffs, occupying in many instances a vertical face from 70 to 100 feet in height. North of Cape Paulet these limestones disappear, and the cliffs along the coast to Cape Chin are altogether occupied by the Niagara escarpment, and vary in height from 120 to 160 feet.

Important as is this escarpment from a geological stand-point, it is found to be no less effectual as a meteorological agent, in its relation to the vegetation of this portion of Ontario. The immediate coast along the southern and south-western portions of the Georgian Bay

is naturally exposed much more effectually to the boreal winds from the Muskoka territory than is the district lying along the eastern shore of Lake Huron. These cold winds act as refrigerators on the vaporous atmosphere of the Georgian Bay, and are therefore productive of a supply of snow much more abundant than that found along the immediate coast of Lake Huron. The soil, therefore, undisturbed by the varying temperature which affects other districts further south, seldom freezes to any great extent, and consequently must exert a marked influence upon the vegetation of early spring. Such indeed is found to be the case. The snow remains till late, and when it finally disappears, vegetation bursts out with astonishing rapidity and vigour. Doubtless similar physical causes render the vegetation of the Muskoka district equally precocious and exuberant; so that here on the 45th parallel of latitude, and before the end of May, may be seen peas, beans and potatoes several inches above the ground. To some what different climatological influences, however, is that region exposed which borders on the coast of Lake Huron. Here likewise, the prevailing winds are from the north and north-west, but these are materially modified in temperature in their passage over such a body of water. Lake Huron, with its area of 23,780 square miles, cannot but dispense a degree of moisture to its shores not to be found in more inland localities, and must consequently exercise an equalizing effect upon the summer and winter temperatures of the atmosphere near the coast-line. Here, however, we find no protecting rock-escarpments so congenial to the more northern vegetation of the Georgian Bay, but a continuous cliff-line of brown clay raised on an average 100 feet above the lake. While, therefore, in the former area are found on the one hand introduced forms which survive the inclemency of winter under its heavy carpeting of snow, and on the other, herbaceous vegetation delighting in boreal winds and the moist cool crevices of rocks;—in the latter grow arborescent types, the vitality of whose fruit-bud could only be preserved by an equable and moist atmosphere, and the majority of which are decidedly southern in range. As corroborative of this conclusion may be cited the fact that in the neighbourhood of our great lakes the isothermal lines trend southward, the curve being considerably more acute on the eastern than on the western shores. In this connection it may be observed that the following introduced trees and shrubs grow and flourish most luxuriantly at Royston Park, Owen Sound:—

Forsythia viridissima.
Cydonia japonica.
Pyrus aucuparia.
Deutzia scabra.

Deutzia gracilis var. *crenata.*
Chionanthus virginica.
Rhus cotinus.
Viburnum odoratissimum.

It is somewhat remarkable that the majority of all the shrubs in cultivation, either in Toronto or St. Catharines, can here be brought to perfection without any artificial protection whatever, but that on the exposed coast-line of Lake Huron such forms cannot be openly cultivated, the snow supply not being sufficient, nor its continuance constant enough, to afford the necessary protection.

Before leaving this portion of our subject it may not be uninteresting to indicate certain preferences among the plants of this area for the Niagara and Clinton limestones, a fact which at once suggests an explanation of the many anomalies in the botanical geography of the district. The Ferns, *Scolopendrium officinarum*, *Pelaea atropurpurea*, *Aspidium felix-mas*, and *A. lonchitis*, may more especially be cited as peculiar, so far as investigation goes, to the Niagara and Clinton Formations of Canada. Of these, *Scolopendrium officinarum* has been reported from only two localities in North America, the one at Onondaga in New York State, the other in the vicinity of Owen Sound, Ontario. *Pelaea atropurpurea* has been detected at different stations along the Niagara escarpment, from the Falls to Owen Sound and Colpoy's Bay; and *Aspidium lonchitis* seems to be confined to the Niagara escarpment of the Bruce Peninsula. Among the mosses, however, we discover a more marked predilection for the Niagara and Clinton rocks of Canada. The following brief catalogue in all probability includes the principal forms under this relationship:—

Anodus Dorianus.
Seligeria recurvata.
S. pusilla.
Gymnostomum curvirostrum.
G. rupestre.
Hypnum Sulivantii.
H. brevirostre.
H. Somerfeltii.
H. chrysophyllum, var. *rupestre.*
H. compactum.
H. deplanatum.
Bryum albicans.

Bartramia calcarea.
Didymodon luridus.
D. cylindricus.
Desmotodon ———.
Trichostomum tophaceum.
Fissidens grandifrons.
Dicranum Schreberi.
Eucalypta streptocarpa.
Cotocopium nigratum.
Trichostomum rigidulum.
Mnium serratum.
Barbara fallax.

Leskia nervosa.

Of the above, *Anodus Dorianus*, *Seligeria pusilla*, *Hypnum compactum*, and *Coloscopium nigratum*, may more particularly be cited as decidedly peculiar to this geological formation; *A. Dorianus*, from the Indian River, Owen Sound, not having hitherto been met with in any other portion of North America.

Gymnostomum curvirostrum and *Fissidens grandifrons* appear in great abundance alike at Owen Sound and the cliffs of the Niagara River, but are not reported from any other Canadian locality. Of the Liverworts apparently confined to this district and Formation, may be mentioned more especially the *Jungermannia cordifolia*, the *Riccia sorora*, and the *Medothea porella*. Other examples, moreover, of the influence exerted on distribution by the chemical nature of the habitat, could in this connection be cited, exemplifying even more characteristically a similar peculiarity of range.

Upon Laurentian soils and strata occur a number of species not elsewhere detected in Canada, so far as our present knowledge of their distribution extends. The more characteristic of these are given in the following list:

<i>Polygonum cilinode.</i>	<i>Aira flexuosa.</i>
<i>Kalmia angustifolia.</i>	<i>Trisetum subspicatum.</i>
<i>Lobelia Dortmanni.</i>	<i>Asplenium ebeneum.</i>
<i>Limnanthemum lacunosum.</i>	<i>Woodsia Ilvensis.</i>
<i>Pinus rigida.</i>	<i>Aspidium fragrans.</i>
<i>Potamogeton Claytonii.</i>	<i>Grimmia leucophaea.</i>
<i>P. Vaseyi.</i>	<i>Racomitrium microcarpum.</i>
<i>P. amplifolius.</i>	<i>R. Sudeticum.</i>
<i>P. Robbinsii.</i>	<i>R. Canescens.</i>
<i>P. rufescens.</i>	<i>Hedwigia ciliata.</i>
<i>Carex Houghtonii.</i>	<i>Dicranum spureum.</i>
<i>C. lenticularis.</i>	<i>Rhabdoweissia fugax.</i>
<i>C. longirostris.</i>	<i>Trichostomum glaucescens.</i>
<i>Lycopodium inundatum.</i>	<i>Fontinalis antipyretica, var. gigantea.</i>
	<i>Hypnum rugosum.</i>
	<i>Jungermannia barbata.</i>

From the Rivière aux Sables on the south to the Niagara escarpment on the north, no rock exposures are met with of sufficient importance to exercise any appreciable effect upon the vegetation of the region. Along the valleys of the Saugeen, Maitland, and Bayfield Rivers, and upon the intervening gravel ridges, we find, with a few exceptions, the usual woodland types of more or less general

distribution throughout the Province. Further south, however, along the valley of the Rivière aux Sables, exist what are called the *sandy plains* of Bosanquet, composed of a white shifting sand, which, towards the coast, has been thrown up by the action of the wind into parallel dunes, rising in some instances to the height of 140 feet above the level of the plain, and resembling ordinary ridges of hill, formed by the usual process of denudation. Southward from the Aux Sables the steep clay terraces, which to the northward are observed overlooking the lake, keep gradually receding from the coast-line, until within the vicinity of Sarnia, on the St. Clair, where the clay again makes its appearance, and continues thence southward to Lake Erie. The area between this ancient lake-margin and the present beach is everywhere covered by drifting sands, similar to those of the Bosanquet plains of the Aux Sables. A sand-area of a somewhat analogous nature is traceable northward from Clark Point to the mouth of the Saugeen River, a distance of about 35 miles, and is found to occupy another portion of the former eastward extension of the waters of Lake Huron.

No portion of this district, however desert in repute and in fact, is destitute of a certain amount of vegetation. The ceaseless motion of the sand precludes the possibility of a grassy, green sward, and favours only a scattered growth of perennials, springing from thick and usually deep-seated roots or root-stocks, which, under the partial protection afforded by the scrubby growth of the oak and pine, are able to maintain a sturdy growth till comparatively late in the season. The more generally predominant species are here enumerated:—

<i>Helianthus divaricatus.</i>	<i>Quercus ilicifolia.</i>
<i>H. strumosus.</i>	<i>Pinus resinosa.</i>
<i>Helianthemum Canadense.</i>	<i>P. Strobus.</i>
<i>Liatris cylindracea.</i>	<i>Juniperus Sabina, vas. procumbens.</i>
<i>L. scariosa.</i>	<i>Prunus pumila.</i>
<i>Aster multiflorus.</i>	<i>Lithospermum hirtum.</i>
<i>A. undulatus.</i>	<i>Asclepias tuberosa.</i>
<i>A. azureus.</i>	<i>Euphorbia corollata.</i>
<i>A. cordifolius.</i>	<i>Lathyrus maritimus.</i>
<i>A. ptarmicoides.</i>	<i>Solidago bicolor.</i>
<i>Quercus alba.</i>	<i>S. nemoralis.</i>
<i>Q. rubra.</i>	<i>S. arguta.</i>

This vegetation, characterized as it is by a monotonous sameness of aspect, may be considered as affording a fair, though by no means

a complete, representation of the Flora of the sand-area of the eastern coast of Lake Huron.

As the whole area explored, owing to geographical position and physical features generally, favours alike a northern, southern, and provincial climate, so we find the vegetation more or less naturally divided into three sections, which it is deemed proper to consider separately :—

1. **BOREAL TYPE.**—Species found in greater abundance on Lake Superior and northward, and most of which have migrated southward.
2. **PROVINCIAL TYPE.**—Species more or less generally distributed throughout the Province.
3. **AUSTRAL TYPE.**—Species more characteristic of more southern latitudes, and which have probably migrated from the south.

BOREAL TYPE.—The species partaking of an undoubted boreal nature are for the most part confined to the Bruce Peninsula, the southern portion of the Georgian Bay, and the so-called Fishing Islands lying a few miles off the Bruce coast of Lake Huron. The southern limit may be set at the mouth of the Rivière aux Sables (north), south of which, as has been remarked above, the vegetation approaches that of the sandy plains of the Aux Sables further south. Strictly speaking, however, plants of a marked northern range are of frequent occurrence throughout the Province, distributed more especially through our swamps of tamarack and cedar. It is well known that districts whose drainage is impeded by physical or other causes become natural sources and habitats of plants demanding a temperature much below that required by our woodland species, or those on the southern slopes of our sand and gravel ridges. Botanically considered, these swamps or peat bogs dimly represent outliers or isolated portions of the great Arctic or Scandinavian Flora, and thus with historic interest bear testimony, as conclusive as do the Alpino-Arctic types of the White Mountains and the Pyrenees, to the former almost universal extension of the Arctic Flora over the temperate zone, and its comparative degree of continuity, as evinced by the occurrence of representative species in regions physically adapted for boreal forms. These depressions of surface occupied by peat bogs, or lakes and ponds with which such localities are often studded, are of frequent recurrence throughout the area indicated by the title of this paper. From the plains of the Aux Sables (south) to the latitude of Goderich, the Cedar (*Thuja occidentalis*) is eminently charac-

teristic; whilst north of this line the Tamarack (*Larix Americana*) holds almost universal sway. In all cases we meet with a profusion of ericaceous shrubs, belts and clumps of evergreens, and a mossy carpeting, knee-deep with the sphagnous species *S. cymbifolium* and *S. acutifolium*. Here also are found in frequent abundance the following mosses, all apparently of high western and northern range:

<i>Hypnum cordifolium</i> .	<i>Dicranum Schraderi</i> .
<i>H. giganteum</i> .	<i>D. undulatum</i> .
<i>H. uncinatum</i> .	<i>D. Drummondii</i> .
<i>H. nitens</i> .	<i>Mnium affine</i> .
<i>H. Blanduvii</i> .	<i>Bryum binum</i> .
<i>H. tamaricinum</i> .	<i>Fissidens adiantoides</i> .

Intimately associated with the latter, but less abundantly distributed, occur the sedges, *Carex teretiuscula*, *C. stricta*, *C. irrigua*, *C. vaginata*, *C. riparia*, *C. utriculata*, *C. filiformis*, *C. flava*, *C. gynocrates*, *C. tenella*, *C. canescens*, *C. trisperma*, *C. flexilis*, and *C. intumescens*. The usual monotonous appearance of this meadow herbage is to some extent modified by the growth of the grasses *Muhlenbergia glomerata*, *Phragmites communis*, *Calamagrostis Canadensis*, *Phalaris arundinacea*, *Glyceria elongata*, and *G. Nervata*; whilst the minor flora is marked by the luxuriant orchidaceous growth of *Platanthera dilatata*, *P. hyperborea*, *P. obtusata*, *P. orbiculata*, *Cypripedium pubescens*, *C. spectabile*, *C. arietinum*, *C. acule*, *Calypso borealis*, and *Calopogon pulchellus*. The district comprised between Cabot's Head, the most northern projection of the County of Bruce, and a line drawn from Owen Sound to Chief's Point on Lake Huron, will be found to include the majority of the more truly boreal forms of the eastern shore of Lake Huron. This area is, botanically considered, almost distinct enough to admit of a separate consideration, but owing to the present immature stage of our knowledge regarding its more inland vegetation, such a limitation in the present instance would be altogether inadvisable. The following list may be considered as containing the more characteristic boreal forms found within our area:

<i>Thalictrum dioicum</i> .	<i>Lobelia Kalmii</i> .
<i>Coptis trifolia</i> .	<i>Campanula rotundifolia</i> .
<i>Drosera rotundifolia</i> .	<i>Vaccinium oxycoccus</i> .
<i>D. longifolia</i> .	<i>Kalmia glauca</i> .
<i>D. linearis</i> .	<i>Ledum palustre</i> .
<i>Parnassia palustris</i> .	<i>Pyrola rotundifolia</i> .

<i>Stellaria borealis.</i>	<i>Pyrola secunda.</i>
<i>Polygala paucifolia.</i>	<i>Moneses uniflora.</i>
<i>Lathyrus ochroleucus.</i>	<i>Primula Mistassinica.</i>
<i>Potentilla anserina.</i>	<i>Physalis grandiflora.</i>
<i>P. Norvegica.</i>	<i>Helenia deflexa.</i>
<i>Epilobium palustre.</i>	<i>Rumex salicifolia.</i>
<i>Hippuris vulgaris.</i>	<i>Platanthera orbiculata.</i>
<i>Ribes rubrum.</i>	<i>P. obtusata.</i>
<i>R. lacustre.</i>	<i>P. hyperborea.</i>
<i>Cornus stolonifera.</i>	<i>P. dilatata.</i>
<i>Linnaea borealis.</i>	<i>Allium Schenoprasum.</i>
<i>Lonicera caerulea.</i>	<i>Tofieldia glutinosa.</i>
<i>Galium boreale.</i>	<i>Scirpus sylvaticus.</i>
<i>Solidago Houghtonii.</i>	<i>S. caespitosus.</i>
<i>Aster borealis.</i>	<i>Carex flexilis.</i>
<i>Tanacetum Huronense.</i>	<i>C. lenticularis.</i>
<i>Artemisia Canadensis.</i>	<i>C. gynocrates.</i>
<i>Cirsium undulatum.</i>	<i>C. scirpoidea.</i>
<i>Hieracium Canadense.</i>	<i>C. Buxbaumia.</i>
<i>Nabalus racemosus.</i>	<i>C. Monosperma.</i>
<i>Alopecurus aristulatus.</i>	<i>Thitium repens.</i>
<i>Calamagrostis stricta.</i>	<i>Aspidium lonchites.</i>
<i>C. Canadensis.</i>	<i>Asplenium viride.</i>
<i>Cinna arundinacea.</i>	<i>Cetraria Islandica.</i>
<i>Graphephorum millicoides.</i>	<i>Cotoscopium nigratum.</i>
<i>Glyceria aquatica.</i>	<i>Selaginella selaginoides.</i>

Many of the above-named species are confined to the Bruce Peninsula, and are apparently southern waifs from the more northern sub-arctic vegetation of the Lake Superior region, encouraged hither by a damp climate, a low temperature, and a great radiation of heat and moisture. These interesting wanderers suggest many reflections, of which the most attractive is that relating to the common origin, subsequent dispersion, and final segregation in the temperate regions of the northern and southern hemispheres, of many of the forms above enumerated. Of their birth-places as species, nothing is yet definitely known; whilst to account for their dispersion and segregation, only one theory has been advanced that is at the same time tenable and probable. We allude to Mr. Darwin's famous hypothesis which assumes that these and other boreal types were driven from our temperate latitudes into the Torrid Zone during the cold of the Glacial Epoch, and, on the return of warmth, retreated in opposite directions back towards the Poles, ascending to the Alpine summits of the mountains that crossed their line of march. This is not the

place wherein to discuss this plausible theory, though in passing it may be remarked that it demands a persistence of specific type through enormous periods of time, and over enormous areas, and under incalculable changes of conditions, that at first sight tells with considerable force against Darwin's own theory of the origin of species by natural selection.

PROVINCIAL TYPE.—Throughout the wooded district of the east coast occur a number of species of very wide distribution over the whole Dominion. These are found diffused through the Provinces from Newfoundland to Lake Superior, and are eminently Canadian in type.

AUSTRAL TYPE.—As we proceed southward from the Bruce Peninsula towards the Rivière aux Sables (south), we come upon a vegetation approaching more and more to that of the coast of Lake Erie, or that of the western portion of the State of New York. The forests south of the Maitland, and more particularly those of the Bayfield and Aux Sables Rivers, are characterized by an abundance of Oak, (*Quercus rubra*, *Q. macrocarpa*, *Q. coccinea*, *Q. alba*), and Red Pine (*Pinus resinosa*); and outlying patches of the White Pine (*Pinus strobus*), are of frequent occurrence over the southern part of Huron County, and the Township of Bosanquet, in the County of Lambton. The Tulip Tree, or so-called White wood (*Liriodendron tulipifera*), decidedly a south-western type, and heretofore reported only from that portion of Ontario circumscribed by London, Hamilton, St. Catharines, and Sandwich, is found in great abundance along the Lake, and inland from the Township of Sarnia northward to the valley of the Bayfield River—the latter locality being its most northern home in North America. Among the sands of the Rivière aux Sables, and growing abundantly with the Red Pine and Staghorn Sumach (*Rhus typhina*), was found the southern *Quercus ilicifolia*, the Black Scrub Oak, a straggling shrub from three to eight feet in height, with petiolate leaves, whitish-downy beneath, a subturbinate cup and ovoid acorn. In the *intervale* lands of the above-named rivers grows in great abundance the Buttonwood (*Platanus occidentalis*, a tree which further south, along the mud-flats of the Thames, attains gigantic proportions. Here too are found in greater or less abundance the Black Walnut (*Juglans nigra*), the Flowering Dogwood (*Cornus florida*), the thick, shell-bark Hickory (*Carya sulcata*), the American Crab Apple (*Pyrus coronarius*), the Sassafras

(*S. officinale*), and the *Euphorbia corollata*, all plants of southern origin, and elsewhere in Ontario but locally distributed—the range in almost every instance being south of their present locations. The Golden Club (*Orontium Aquaticum*), an aquatic perennial with a deep root-stock, and strongly-nerved floating leaves, was detected in a pond near the embouchure of the Bayfield River. This station is certainly wonderfully inland for a plant usually found delighting in ponds near the sea coast and in river marshes of the tide-water, being in its present habitat nearly 700 miles from the sea. Heretofore its more northern station has been a point about 400 miles up the valley of the Susquehanna, at Gilbertsville, in the County of Otzego, (Paine). On the wooded hillsides of the Aux Sables and Lake Burwell occurs the Chestnut (*Castanea vesca*), with its aments as long as its leaves, and so numerous as to impart a yellowish hue to the whole tree when in blossom. Equally remarkable for its long pendulous aments of barren flowers hanging from the ends of its branches, though in other respects so dissimilar, is the shrubby Hazelnut (*Corylus Americana*), which in the barren plains of Bosanquet is found in great abundance, associated with the Red Pine, the Staghorn Sumach, and the Black Scrub Oak. The following species comprise the more important additional representatives of this division :—

<i>Thalictrum anemonoides</i> .	<i>Aster levis</i> , var. <i>cyaneus</i> .
<i>Hypericum kalmianum</i> .	<i>Artemisia biennis</i> .
<i>Enonymus atropurpureus</i> .	<i>Lobelia spicata</i> .
<i>E. Americana</i> .	<i>Monarda didyma</i> .
<i>Vitis riparia</i> .	<i>Physalis viscosa</i> .
<i>Lupinus perennis</i> .	<i>Prosartes lanuginosa</i> .
<i>Erigenia bulbosa</i> .	<i>Juncus acuminatus</i> .
<i>Gerardia integrifolia</i> .	<i>Panicum virgatum</i> .

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